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NOTES ON THE ROCK DOVE (*COLUMBA DOMESTICA*).¹

BY CHARLES W. TOWNSEND, M.D.

THE two familiar birds of city streets are the European House Sparrow, or English Sparrow as it is generally called, and the Rock Dove, commonly known as Pigeon. Both are equally fearless in the presence of man and all his works, and both are equally dependent on their own exertions for a living, although both are fed more or less irregularly by the passer-by, chiefly for the pleasure afforded by the sight of the crowding, eager birds. The English Sparrow is properly included in most bird lists as an introduced species. The Pigeon, however, is seldom mentioned, because here it is domesticated or was originally introduced in this state and has since become feral.² In most cities both here and in Europe it has reverted in plumage and habits to the wild state of its ancestor, the Rock Dove, with the exception that instead of breeding in holes and fissures of rocky cliffs, it now breeds in similar situations on buildings in cities. In small towns and villages the Pigeons are generally owned and fed by individuals, and live in dovecotes. A study of the habits of the unconfined bird as seen in cities in this country, and a comparison of its habits with those of its feral progenitors seems worth while. I commend it to ornithologists living in cities who lament that they have no birds to study.

That the various fancy races or domesticated forms of the Pigeon, some 200 in all, are descended from one species, the Rock Dove, *Columba domestica*, is now well recognized, although it was formerly believed that the chief races were of separate lineage. This is not to be wondered at, when we consider the extraordinary diversity shown, not only in external plumage and form, but also in internal structure by those races, some of which, it is believed, date back to prehistoric times. One has but to glance at a pouter, a carrier, a barb, a fan-tail, a turbit, a tumbler or a trumpeter,

¹ Stejneger, Proc. U. S. Nat. Mus. X, 1887, p. 424, has shown that Linné's *C. livia* is a *nomen nudum* and that *C. domestica* of Gmelin must be used.

² See, however, O. W. Knight, *Birds of Maine*, 1908, p. 208, and G. M. Allen, *Fauna of New England, List of Aves*. Boston Soc. Nat. His., 1909, p. 226.

for example, to realize the immense plasticity of the species and the changes wrought by artificial selection through the ages. Darwin showed that all these races, although breeding true, were fertile among themselves, and that the hybrids were fertile; that the young of the different races could hardly be distinguished apart within twelve hours of hatching; and lastly that diverse races and their hybrid offspring when bred together result in Rock Doves, typical in form and plumage.

This same interbreeding has occurred in the flocks of Pigeons seen in our cities. Here the majority of the birds have the general grayish-blue color with iridescent necks and breasts, white rumps, white axillaries and lower wing coverts, two black wing-bars and black terminal or sub-terminal tail bands, typical of the Rock Dove. Albinism is not uncommon in these flocks but irregular plumage is rare, and unusual form is practically never seen. In a flock of 83 Pigeons seen on Boston Common, one bird was a full albino, four partial albinos, three were chocolate-colored and the rest nearly all in the regular plumage. A few of these were darker blue than usual with little or no white on the rumps, and a number more showed slight albinism in the wing feathers, seen only in flight. In a group of 150 birds counted at another time, one was chocolate-colored, 12 more or less albinistic and the rest nearly typical of the Rock Dove.

I am inclined to think that the prevalence of albinism in these Pigeons may be partly accounted for by the fact that there are, with rare exceptions, no hawks in cities to pick off prominently marked birds, for it is reasonable to suppose that a bird, conspicuous through albinism, would afford a more shining mark to a hawk, and would therefore be more subject to capture. This supposition is borne out by an observation related to me by Mr. William Brewster. He brought to his place at Concord a flock of Pigeons, the majority of which were more or less albinistic or else were light chocolate in color, but about one fourth of the flock were in the ordinary plumage of the Rock Dove. The flock was from time to time harried by hawks who killed a number of the birds, and the interesting part is that at the end of some three years the albinistic and chocolate-colored birds were practically all weeded out and the typical blue birds alone remained.

The Rock Dove is common wherever caves or deep fissures exist on the rocky coasts of Scotland and Ireland, in the Shetlands, Orkneys, Hebrides and Faroes. In England, according to Howard Saunders,¹ it is "very local in Devonshire, and only a few frequent the cliffs of Cornwall. It can be traced along the coast of Wales, and at one spot in Cumberland, as well as the Isle of Man, while on the eastern seaboard it is found at Flamborough Head and in Northumberland. Birds,—apparently wild,—sometimes frequent holes in cliffs inland as well as on the coast, but they are open to the suspicion of being partially domesticated individuals which have reverted to a wild state, or descendants of such." In Scandinavia the Rock Dove is rare and local and it is uncommon in the rest of Europe except in the mountains of Portugal, Spain and Italy. Darwin pointed out that as one goes south and east the rump changes in color from white to blue. Hudson² says of the Rock Dove: "In its language, flight, and habits it is indistinguishable from the bird familiar to every one in a domestic state." Selby³ says that it "is never known under any circumstances to affect the forest or perch upon a tree." Saunders⁴ says "It has a marked objection to settling on trees — a peculiarity which is still shared by its domesticated relatives." In the British Isles it nests from April to September, and lays two sets of two eggs each.

The courtship of the Rock Dove is the same in our city streets as on wild rocky coasts. It may be seen here nearly every pleasant day from January to December. The male coos long and frequently, and expresses himself in the syllables *coo-roo-coo* or *cock-a war*, the last syllable in either case much prolonged. He stretches his neck now up, now down and, with puffed out breast, displays to full advantage his brilliant iridescent feathers. His tail is spread and scrapes stiffly on the ground and his wings are drooped slightly. At times the amorous bird advances and retreats, pirouettes now this way now that, in order that the meek and apparently indifferent female — actually slightly smaller but now very noticeably smaller — may be duly impressed. At times he makes little

¹ *Manual of British Birds*, 1889, p. 471.

² *British Birds*, 1902, p. 262.

³ *The Naturalist's Library, Ornithology*, 1835, vol. V, part III, p. 147.

⁴ *loc. cit.*

jumps into the air, and occasionally flies a few feet. At times, when not actually courting, he caresses his mate by kissing or billing and at times feeds her with "pigeons-milk." Again the happy pair preen each others feathers and search for tormenting inhabitants in a manner suggestive of monkeys or certain savages.

The fighting that goes on between rival males is an important part of the courtship, a fact that is generally overlooked in poetical accounts of the gentle, cooing dove. These cliff-dwellers on window ledges and projecting copings of high buildings may often be seen engaged in sparring with their wings. Sometimes only one, sometimes both wings are used, and the birds strike with considerable force and swiftness and deliver the blows on each others heads and necks and sometimes push or ward with one wing and strike with the other. The contest is often continued with but little advantage on either side for minutes at a time, but generally results in the weaker — not going to the wall — but being forced away from it off the ledge and having to use his weapons for flight. Sometimes the conquered one returns at once to the fray but often is obliged to content himself with a humbler station and the victor, undisturbed, struts and coos before his shy mate. The fighting is distinctly a cliff performance, with the object of pushing the rival off the ledge. Knight¹ says: "I have seen the fight protracted until one is killed or completely exhausted." On the outer edge of a Pigeon's wing is a bare spot of thickened integument.²

The nearest approach to rocky caves in cities are to be found in church towers, and these are favorite nesting sites. Open situations on window ledges and various architectural projections on buildings are, however, freely used. The nest is often built in some of the busiest streets just above the passing wagons, and I have seen one on an iron beam under a noisy elevated car station close to an arc light. The nest is unattractive by reason of the liberal amount of dung with which it is daubed and of which in many cases it is chiefly composed. The walls of the building below and in the vicinity are also spattered. To avoid this disfigurement of buildings the ledges are sometimes built up or covered at such

¹ loc. cit.

² vide Lucas. *The Weapons and Wings of Birds*, Report of U. S. Nat. Museum, 1893, p. 656.

steep angle that the birds are unable to alight, and "pigeon-proof" architecture is spoken of. Besides the dung, small sticks are used in the construction of the nest, and there is generally a scanty lining of feathers. The nests vary in size, but are sometimes built up from repeated use to a height of six or seven inches, and are about fourteen inches in outside diameter.

The number of broods raised by these wild descendants of domesticated birds varies very much and is said to be four, but their eggs may be seen in almost every month of the year. The eggs are two in number and pure white in color, characteristic of the hole inhabiting birds. Incubation lasts about two weeks and both parents take part. The young are covered with loose grayish or yellow down and rapidly grow to full size and attain a plumage very similar to that of the adult. They lack the iridescent feathers and are slightly mottled.

The feeding of the young with the so called "pigeon-milk" by both parents is an interesting phenomenon. The adult thrusts its bill deep down into the side of the bill of the squab, vibrates its wings and works its neck muscles in a pumping manner. The squab, when not actually engaged in the feeding process, waves its wings and calls in beseeching, whistling notes for more. An examination of the gullet of the adult shows a large reticulated glandular crop from which a gelatinous fluid can be squeezed. This secretion mixed with, and serving to digest the contents of the crop forms the pigeon-milk with which the young birds are fed. As the young grow, grain and other food partially digested is given.

The cliff-inhabiting proclivities of our city Rock Doves is shown by their night-roosting habits. Besides church towers, which furnish the caves, the ledges on the buildings are thus occupied. Numerous ledges on the different façades of the Court House in Boston are favorite resorts, as are also the long ledges under the eaves of Arlington Street Church and the window ledges on a building on Tremont Street opposite the Common. Whole rows of birds may be seen sleeping peacefully in these situations amid the glare of electric lights and the noise of traffic in the streets. These night roosts are favorite resting places in the day and are often more or less occupied in dark and stormy weather.

The Rock Dove also shows evidence of its former life among

rocky cliffs by its inherited objection to alighting on trees, although an interesting change has come over it in Boston at least. Thirty-five years ago I noted, as an unusual event, that a Pigeon was occasionally to be seen on the large branch of an elm tree in Louisburg Square. In my notes of March 30, 1906, I say: "Rarely alight in trees, but does so habitually in Louisburg Square, and occasionally a few on the Common." In my notes of February 9, 1907, I find the following: "Twenty years ago it was a rare thing to see a Pigeon alight in a tree; now there are several places where they commonly alight, and I have seen a flock of 50 in a tree in the Public Gardens. There are two places in the Common where these birds are in the habit of alighting. Single birds or pairs are to be seen anywhere in trees." Since then the habit has continued. The tree referred to in the Public Gardens is one with very large branches devoid of fine sprays — a Kentucky coffee tree — and I have lately counted as many as 100 Pigeons in this tree. Almost always trees with large branches are chosen but I have seen Pigeons on small branches or even on telegraph wires. This change in habit is of interest as an evidence of adaptiveness in a species. It would be interesting to know whether the same change is going on elsewhere in this country or in Europe.

The flight of this bird is worth studying and has many points of interest. If one disturbs a single individual or a flock on the ground so that the birds suddenly take flight in alarm, a loud and sharp clapping noise is usually made, apparently by the striking together over the back of the upper surfaces of the wings. Wm. Macgillivray¹ says: "When startled, they rise suddenly, and by striking the ground with their wings produce a crackling noise." The fact however, that the noise begins and continues after the birds have left the ground seems to disprove this observation. In this connection the following observation by Fielden² of another charadriiform bird, the Knot, is of interest. He says: "Immediately after arrival in June they began to mate, and at times I noticed two or more males following a single female; at this season they soar in the air like the Common Snipe, and when descending

¹ A History of British Birds, 1837, vol. I, p. 273.

² Fielden, H. W., List of Birds observed in Smith Sound in 1875-76, Ibis, 1877, 4 series, vol. I, p. 407.

from a height beat their wings behind the back with a rapid motion which produces a loud whirring noise." As Pigeons that are not suddenly disturbed rise from the ground silently, is it not possible that this loud clapping, made perhaps when the bird is frightened, may subserve a useful purpose in confusing a crouching animal stealing through the grass, and thus prevent its springing at its prey? Be this as it may, it is evident that, as in the case of the Knot, the clapping is at times a courtship action, for, with puffed out neck and breast, a male may fly with loud clapping to alight near a female.

The facts that when well under way in the air Pigeons extend their feet behind under the tail, although they carry them in front for short flights, and that they extend the bastard wing as they glide towards a perch can both be verified by any one with ordinary vision. I have already discussed these points in other papers.¹ It is interesting to speculate that this extension of the bastard wing may point back to the time when the reptilian ancestors of birds grasped with their front extremities the perch to which they were gliding.

The aerial evolutions of a flock of Pigeons are performed with as great precision as is seen in flocks of Shore Birds, Gulls, and Auks, — all relatives of Doves in the group of Charadiiformes. It would seem as if the birds possessed a common mind as each bird in a large flock suddenly turns with military accuracy first its back then its breast to the observer, while the flock sweeps on, now this way, now that, about a church tower. This sudden turning is accomplished by a rotation of the body along an antero-posterior axis through the arc of a quarter to a half of a circle. The flock, flying by an observer with the nearer wings pointed downwards at an angle of 45 degrees below the horizon, suddenly changes so that the nearer wings point upward at an angle of 45 degrees with the horizon. With this change in position or "reverse" the color of the wings appears to change from greyish blue of the upper surface to silvery white of the lower surface. Dewar² has studied these evo-

¹ *The Position of Birds' Feet in Flight*, Auk, XXV, 1909, p. 109.

Bird Genealogy, Auk, XXIX, 1912, p. 285.

² Dewar, J. M. *The Evolutions of Waders*. *The Zoologist*, 1912, 4 ser., vol. XVI, p. 161.

lutions in shore birds and concludes that they are protective in character, originating in attempts to evade birds of prey and afterwards employed against man. He points out the resemblance to wave movement or sea-spray and believes it to be a case of protective resemblance with the object, not of deceiving the hawk as to the reality of the birds, but of baffling pursuit,—all of which is interesting and suggestive.

At any sudden noise, like the bursting of an automobile tire or an explosion of gasoline in a muffler, a flock of Pigeons will in an instant mount into the air, no matter how busy they may have been in feeding, and fly about for some minutes before they return. A flock of Pigeons roosting on the ledges of the buildings on Tremont Street when startled by an explosion whirl away but often return towards the façade only to double back again. Dr. W. M. Tyler has suggested to me that these birds are acting from fear in the same way that their feral ancestors would act if pursued by an eagle or hawk. Edmund Selous¹ says of the wild birds: "In effecting their numerous escapes, the face of the rock stood them in good stead, and they deliberately made use of it, in my opinion, for, dashing in and out, they would cling to it or double against it in places where eagles, as larger birds, could not follow them so deftly, and had perforce to check their speed." Of course the explanation may be, as Dr. Tyler also suggested, that the birds, about to return to their perches, are driven away again and again by the recurring fear. When so engaged in flight, if a second explosion occurs, the whole flock suddenly drops or darts down a few feet while still continuing its rapid course. One cannot help thinking of the similar actions of Shore Birds at the discharge of a gun. I have seen a flock of Black-bellied Plovers dart down in its flight when a gun was fired in another direction some distance off, and, no doubt, under similar circumstances a poor marksman has believed his shot had entered the flock and has wondered that no birds had fallen. The very loud automobile discharge near at hand would naturally startle any bird, but I have seen a flock of Pigeons act in a similar way when the explosion was so distant that it was but faintly heard. One could build up a fanciful theory to the

¹ The Bird Watcher in the Shetlands, 1905, p. 158.

effect that this action of the Pigeons was inherited from ancestors who were pursued by gunners, but this would involve the inheritance of an acquired trait that had existed during the brief time only since gunpowder was used. On the other hand it is possible that the habit has been continued by example from adult to offspring since the feral days of this bird. I have observed a somewhat similar case where a caged canary, not easily disturbed by ordinary affairs of the household, showed great terror whenever a toy balloon floated about the room. This perhaps points back to the more deep seated instinct of fear of a hawk or other large bird hovering overhead. It may be mentioned here that the Pigeon has not yet learned to estimate accurately the speed of an automobile approach. It is able to take care of itself where horses are concerned, but not infrequently lingers too long in the street and is run over or hit by the automobile while it is attempting to fly away. In this respect it resembles the domestic fowl and other animals.

In gliding either in a straight line or in curves and partial circles the wings are held as in most birds about on the same plane with the body, but at times one may see a pair of birds gliding through the air with the wings held up at an angle of forty-five degrees. This is an interesting sight and is apparently of the nature of a nuptial performance.

In alighting in a field the Pigeon frequently first circles over the ground, or, if alighting suddenly, sometimes looks about for a moment before searching for food. This is suggestive of inherited caution from wild ancestry, for the Rock Dove in its native haunts is said to be very wild and suspicious. This caution is not seen when the bird alights in a crowded street.

The typical "dove-like" walk of this bird is familiar; he advances with nodding head as if at each step his head lingered behind while the neck and body kept on. This is seen in a greater or lesser extent in various other birds that walk; it is noticeable in the Ipswich Sparrow.

The sight of a flock of Pigeons sunning themselves on a roof is a familiar one; the birds also have a habit in intervals between feeding of collecting in compact flocks and squatting close together with the tarsi and often the breasts flat on the ground. A group acting thus, all headed towards the wind, suggests the similar habit of Gulls.

I have referred in another paper¹ to the duck-like actions of a fifteen day old Pigeon when put in a tub of water and its bearing on the relationships of this bird to Gulls and Auks. Saunders² says "both wild and tame Pigeons have been seen to settle on the water like Gulls and drink while floating down stream." Mr. Wm. A. Jeffries tells me that he once saw a Pigeon alight on the surface of the Frog Pond in Boston Common. I have seen a Pigeon hovering above Charles River in Cambridge dropping its feet till they touched the water, and picking up something with its bill. This was repeated five or six times. This last named action points to the progressive or adaptive character of the bird and not necessarily to its aquatic ancestry, for I have observed similar actions in picking up food from the water on the part of such dissimilar passerine birds as Bronzed Grackles, Cedar Birds and Swallows.

The English Sparrow is the only bird with which the Pigeon is intimately and constantly associated. As a rule no notice whatever is taken by the larger of the smaller bird or *vice versa*, and both feed amicably on the same ground. On rare occasions, however, I have seen an English Sparrow pursue a Pigeon. Once I saw a Pigeon closely pursue a Belted Kingfisher as it doubled back and forth three or four times over the Frog Pond on the Common.³ In Boston I have known Crows to inflict considerable damage on the eggs and squabs of Pigeons in the rookery of the tower of Trinity Church, and a Duck Hawk feasted daily on adults from his perch on a Commonwealth Avenue church steeple, until a sportsman shot him from his attic window.

In drinking water the bill is held in the pool continuously for half a minute or more at a time, an action very unlike the sipping and holding the head up of gallinaceous birds with which Pigeons were formerly classed. Shore birds when feeding often hold the bill immersed and probably drink at the same time. I have no notes on the drinking of Auks, but I believe that Gulls drink continuously in a similar manner.

In feeding on grain scattered in the street or in horse droppings Pigeons do not scratch. On ground planted with grass seed they

¹ Bird Genealogy, loc. cit.

² loc. cit.

³ Birds of Essex County, 1905, p. 223.

chop vigorously at the ground with their bills causing the earth to fly and making in some cases holes of considerable size. In a garden where numerous strings were stretched which kept away the crows, the Pigeons alighted without fear in the network and chopped holes in the ground to obtain the seeds. On weedy lawns and fields flocks of Pigeons often alight, spread out and systematically eat the weed seeds. Saunders¹ says of the wild birds that they make amends for their fondness for grain by eating weed seeds and the roots of the conch grass (*Triticum repens*). I have seen Pigeons walking along ploughed furrows picking up and eating earthworms and various larvæ exposed. Dr. Glover M. Allen tells me that a few winters ago after a heavy snow fall he observed Pigeons clinging to the Japanese ivy vines on University Hall in Cambridge eating the ivy berries and Mr. Charles F. Batchelder reports seeing a Pigeon perched in a privet bush eating the berries.

On Boston Common it is the custom of visitors to feed the Pigeons with bread crumbs and grain as is done at St. Marks in Venice and at various other cities. The birds flock about in great numbers and alight on the hands, shoulders and heads of the feeders. This familiarity does not necessarily point to the former domesticated state of this bird, for in the same place grey squirrels respond to feeding by nuts in a similar manner, and fearlessly clamber over their benefactor, and investigate his pockets to the astonishment of the rustic visitor, who is familiar with the same animal only at a long gun-shot range. This and the photographs shown us by such men as Harold Baynes point to the millennium for the bird lover when the gun shall have vanished and live birds be treated by everybody as real friends.

¹ loc. cit.